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ABSTRACT

This manual is designed to aid observers in the classroom in the use of an observation form entitled "The Student-Level Observation of Beginning Reading," which focuses on the content of instructional activities in reading at the individual student level. Instructions are provided on how to identify a set of behaviors such as direct and indirect reading activities and on how to code the behaviors and time usage on the form. Information is also provided on successful uses of the observation instrument and on data use and validity. (MKM)

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STUDENT-LEVEL OBSERVATION OF BEGINNING READING MANUAL

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In the past, the behaviors of students during reading instruction have been observed and measured in a variety of ways. There have been studies that examined teacher verbal behaviors during reading, studies that examined student behaviors, and some studies that linked the two. The simplest and most primitive observation schedules merely recorded whether the student was on or off task during reading class regardless of what s/he was on or off task of. A slightly more sophisticated version recorded whether the student was working on the reading material that the teacher had chosen. In this case, if the teacher considered perceptual training to be important, then a student in reading that was putting rubber bands over pegs to copy a pattern would be coded as on task in reading. Quite naturally, the outcome of research that attempted to link on task behavior to reading achievement had mixed results when such global measures were used. One way of refining the observation of student reading behavior was to focus on the contextual and interaction patterns, grouping, and rate of student initiation. While these refinements were a step forward, they still did not redefine observation based on a rigorous definition of what reading is.

A major breakthrough occurred when the Beginning Teacher Evaluation Study (BTES) (Marliave, Fisher, Filby, & Dishaw, 1977) chose to observe teacher and student behaviors in subject matter areas based on a definition of subject matter content derived from curricula and criterion tests. This observation approach included context (group, seatwork), mode (workbook, textbook), and content (vocabulary, comprehension, sentence structure). The problem with these categories of observation is their obvious interrelationships and non-behavioral base. When is vocabulary drill vocabulary, and when is it comprehension? When is sentence structure sentence structure, and not oral reading?

We designed a student-focused instrument to observe beginning reading. The instrument is based on a definite view of what reading consists of (direct reading), and what activities support learning to read (writing, discussion, listening). We assumed that all general knowledge is useful in some way for reading, but that one can draw fairly clear lines between direct and indirect reading behaviors and extremely tangential behaviors.

Three basic notions guided the design of the Student-Level Observation of Beginning Reading (SOBR) system. First, the observations should focus on the content of instructional activities in reading in order to determine if the type of activity in which a student is engaged makes a difference in learning to read. Second, observation should be at the individual student level since students may receive differential treatment and may also respond to the same treatment differentially. Third, the codes should be mutually

exclusive and the system based on a time sample. The output of the system should permit: (1) time spent on specific activities to be cumulated; (2) student time use to be determined; and (3) estimates to be made of how a student spends a day, week, or academic year.

The decisions surrounding how to delineate instructional activities to be observed were determined by our assumptions regarding effective reading instruction. We felt that the more a student actually reads print, the more competent and fluent s/he becomes as a reader. We further assumed that there are activities other than directly reading print that support or reinforce reading skills, but that they are less likely to improve reading skills.

The observation system provides a method for recording student behaviors, interactions a target student has with another person in his/her instructional environment, and the affect of those contacts. The system is designed so that reading behaviors can be observed and recorded whenever they occur, not just during a reading period. For example, if a student is reading instructions for a math problem, this would still be recorded as a reading activity.

While SOBR is designed to capture quite subtle differences in time usage for reading, it is not designed to describe the general life of a student in reading. This particular instrument was developed in order to observe reading at the student level in classrooms for the learning disabled, however, it is not limited in utility to such settings. The observation system described in this

paper can be easily modified to include a variety of additional information including group size, mode of instruction, language of instruction, etc.

Figure 1 is a diagram of the structure of the student coding system. It displays the categories that are coded as decision points that progress from general to specific classes of student behaviors. SOBR permits a classification of how students use classroom time by categorizing non-reading activities as well as those activities defined as reading so that all of the time observed is coded. The general categories are mutually exclusive. Figure 1 is read from left to right across the top row of eight categories. Five of the eight categories are considered non-reading classifications: waiting, academic, management, absent, and out of the room. The off-task category has two sub-divisions, reading and non-reading, depending on whether the target student is supposed to be engaged in a reading activity. If one of these six general codes is used, no further refinement of the code is made. The two reading categories complete the list of eight possible first level decisions.

The two general reading categories, direct and indirect reading, are broken down into more specific detail represented by the branching in Figure 1. Moving down Figure 1 from both the reading categories, the first branch identifies the level of the activity: letters, words, sentences, or paragraphs. Reading down from each of these levels, the next set of branches refers to modes of student response. A direct reading response is coded as silent, oral, or oral drill; an indirect reading response is coded as oral, listen, written

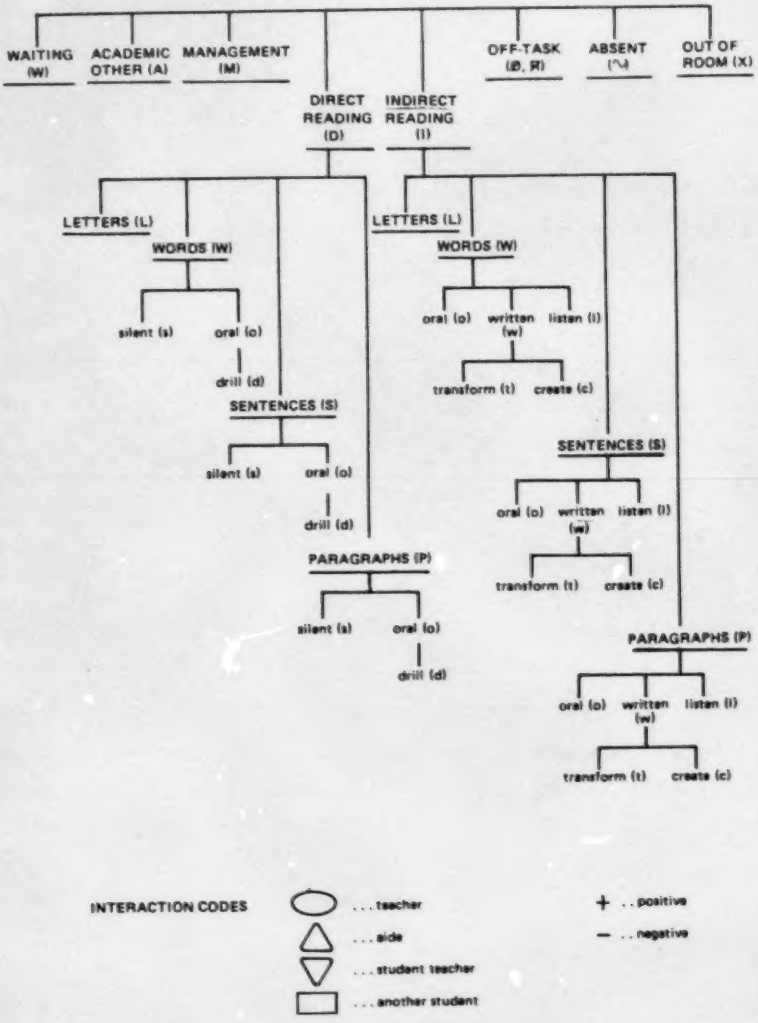


Figure 1. Student Observation of Beginning Reading (SOBR)

transformation, or written creation. The codes listed on the bottom of Figure 1 are used in conjunction with the student codes when appropriate. These codes are: teacher, aide, student teacher, and student interactions; positive and negative statements from the teacher.

Another set of codes represented in Figure 2 are teacher level codes that can be used with the student codes. These codes represent the general content of interactions the teacher (or aide) has with one or more target students. Teacher codes record the type and affect of those interactions and include: cognitive (in reading), cognitive explanation (in reading), academic other, management, no interaction, positive and negative statements. This relatively simple set of descriptors yields over 11,000 possible unique and meaningful combinations, without including patterning.

Student Codes

The categories to be coded during student observation are defined in terms of behaviors exhibited by students. Behaviors related to learning to read are the main focus of this observational system, therefore, distinctions are made within the reading categories to provide detail about what the student is doing, while the non-reading categories remain general classifications.

Non-reading category definitions are described first, followed by direct and indirect reading behaviors to be coded, and finally, interaction and affective codes are defined. Each definition includes a summary, examples, and non-examples of the corresponding behaviors. The correct code is within parentheses following the non-examples.

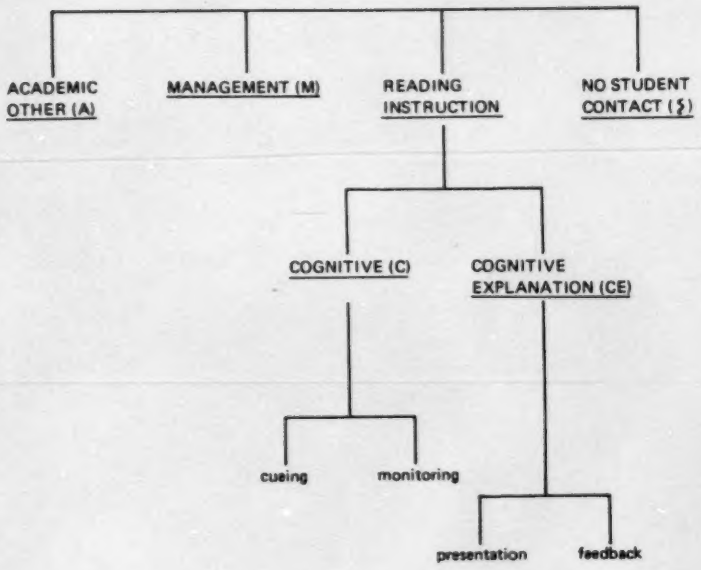


Figure 2. Teacher Observation Codes

Non-Reading Categories

Academic Other (A). This category is used to designate involvement in instructional activities other than those specifically defined in the reading or reading-related categories. This includes activities that are: tangentially related to reading such as perceptual skills, other academic but non-reading tasks such as math, and non-academic tasks such as art. Obviously, if some subset of these activities (math, for example) was of particular interest, it could be broken out and coded separately. The academic other category is coded if the target student is:

-working on math calculations
(but not reading print as in a word problem)
-making a collage
-talking about a field trip
-copying designs

This category is not coded if the target student is:

-getting paper from the teacher's desk (M)
-listening to a recorded story with a book open on his/her desk (IPL)
-reading a science chapter (DPS)
-raising his/her hand to indicate that assistance is needed (W)

Management (M). This category is used to designate those activities that involve preparing for a task or wrap-up activities after a task is complete. This category is coded if the target

student is:

-getting books or paper

-sharpening a pencil

-flipping through pages of a book to find the correct page

-moving into a reading group

-putting materials away

-erasing a sentence from his/her paper

This category is not coded if the target student is:

-wandering around the room (Ø)

-standing in line to receive materials (W)

-pointing to a word on the chalkboard (IWWT)

Waiting (W). This category is used to designate that the target student is waiting for something or someone. When a student is not working, some clues that indicate that s/he is waiting include: hand in the air, standing in a line, sitting at a teacher table, clear verbal indication of needing materials (e.g., "Mrs. Smith, I don't have that paper," and then sitting waiting for it), etc. This category should be distinguished from getting or putting away materials which is coded as M. The W category is coded if the target student is:

-standing in line near a teacher to receive an assignment

-raising a hand to have work checked

-sitting at a teacher table to receive instruction

-sitting at a desk till some needed equipment is available

This category is not coded if the target student is:

-talking to another student (Ø)

-looking for the materials needed (M)

-daydreaming with a book open on his/her desk (Ø)

Absent (~~). This category is coded if the target student is not in school on the day of observation. This can be determined or confirmed by the teacher, aide, or school records depending on which is most easily accessible.

Out of the room (X). This category is coded if the target student is present at school but is physically out of the room at the time of observation. The student may be out of the room for a variety of reasons including going to the bathroom, going to another classroom for instruction, and running errands for the teacher.

Off-task (Ø). This category is coded if the target student is supposed to be engaged in an activity (other than reading) but is not actively engaged in that activity. Personal behaviors and activities that are usually disciplined by the teacher are considered to be off-task. The student may be wandering around the room, daydreaming, tying his/her shoelaces, or hitting another student. While it may be advantageous to know what activity the student was supposed to be doing when s/he was off-task, it is most often too difficult to determine the specific nature of an activity in which a student is not engaged. For example, a student who is wandering around the room may have been directed to get some materials or to do math problems on a "mathiputer", but the observer may not be able to determine what preceded an observed student behavior. The only distinction made within the off-task category is between reading and non-reading activities. An Ø is coded if the target student is:

-wandering around the room

-talking to another student about an unrelated activity

-being disciplined by the teacher

This category is not coded if the target student is:

-putting away materials (M)

-talking to another student about an art project (A)

-sitting at a desk with a flag raised to indicate help is needed (W)

The preceding categories account for all non-reading activities.

Reading Categories

Both direct and indirect reading behaviors are defined as occurring in the presence of print. If an activity is coded as reading, the level of the printed presentation to which the student is responding is also coded. Four categories shown in Figure 1 delineate the level of the material with which a student may be engaged: letters, words, sentences, and paragraphs.

A letter code (L) is used when the target student is presented with or is working with a letter, a series of letters, blends, digraphs or, in general, any combination of letters that is not a complete, meaningful word. At the letter level, no distinction is made with regard to the student's mode of response, that is, between silent or oral reading, because reading letters silently, while theoretically possible, is a rare event. Therefore, if a student is engaged in an activity at the letter level, only two letter codes are used (DL or IL), and the decision between whether the activity is

direct reading or indirect reading depends on whether or not it involves direct letter-sound correspondence. The distinction is based on the assumption that letter-sound correspondence (DL) is a more direct prerequisite to learning to read than manipulating letters in other ways, such as circling a single letter in a page of letters (IL). Activities coded as IL may be thought of as reinforcing or supporting beginning reading skills.

The other three levels of presentation of a direct or indirect reading activity are parallel to each other and include the additional code for the mode of student response. A word is defined as the printed representation of a meaningful unit. A student working at the word level could be engaged in an activity with print presented as a single word, a list of words, or any combination of words where the focus is on a word in isolation, not on continuous or meaningful text.

A sentence is defined as three or more related words that form a phrase or express a thought. Reading single targeted words embedded in sentences is not considered sentence reading but word reading. Sentence reading is coded only if the target student is reading groups of meaningfully related words.

A paragraph is defined as three or more visually connected and thematically related sentences. Once again, reading single targeted sentences or words embedded in a paragraph is not considered paragraph reading.

In addition to deciding at which level the activity is focused, the observer codes whether the activity is direct or indirect reading. Direct reading activities are distinguished from indirect reading

activities by their proximity (not to be confused with importance) to the final goal of reading instruction, that is, reading print either silently or orally. Direct reading activities always involve students responding to print in the same direction as they would if they were actually reading.

Direct Reading: Letters (DL). This category is coded if the target student engages in direct letter to sound correspondence (i.e., the student says the sound a letter represents), or sound to letter correspondence (i.e., the student says the name of the letter after hearing the sound). Examples of activities considered to be directly reading letters include:

-the teacher points to a letter(s) and the student produces an oral sound, either singly or in unison with the teacher

-the teacher produces an oral sound and the student names the letter(s) that would make that sound

-the student has a workbook open to a page of blends and practices saying the sounds they represent

This category is not coded if the target student:

-writes the letter(s) that makes a given sound (IL)

-reads a word orally that contains a given sound (DWO)

-draws lines from a letter(s) to a pictured referent (IL)

If the target student is engaged in a direct reading activity at the word, sentence, or paragraph level, three distinct codes representing the mode of student response are possible: silent, oral, or oral drill.

Direct Reading: Silent (DWS, DSS, DPS). A silent response is coded if the target student is directly reading print and no voice sound is audible. Some behaviors that may indicate a student is reading silently include: head movement, eye movement, pointing to the printed word(s), lips forming words (but no sound emitted), and the relative position of the print and the student's head and eyes. This category is coded if:

-the target student is reading a list of words silently (DWS)

-the teacher says, "Find the sentence that tells how Johnny felt," and the student reads a list of sentences silently (DSS)

-the target student is listening to a taped story and obviously following along with a book open to printed pages (i.e., not illustrations) (DPS)

This category is not coded if the target student is:

-reading a story at his/her desk and an observer can hear the student's voice (DPO)

-listening to another student read aloud in a group setting and his/her eyes are on the student who is reading (IPL)

-rearranging word cards to form a sentence (ISWT)

Direct Reading: Oral (DWO, DSO, DPO). An oral reading activity is coded if the target student is directly reading print and his/her voice is audible. Therefore, even if a student is supposed to be reading silently, if an observer can hear his/her voice, the activity would be coded as an oral one. A student may be reading aloud either chorally or alone. Examples of this category include:

-reading a list of words aloud (DWO)

-reading a sentence aloud from a flashcard presentation (DSO)

-taking a turn in a group to read the next paragraph aloud (DPO)

This category is not coded if the target student is:

-reading sentences aloud while being timed (DSOD)

-orally supplying a definition for a word
that is presented orally by the teacher (IWO)

-discussing a story that was read in a small group setting (IPO)

Direct Reading: Drill (DWOD, DSOD, DPOD). This category is coded if the target student is engaged in an oral reading activity of a drill type. Some indications that a student may be engaged in a drill activity include flashcards, a timer, rapid pace, or a verbal cue. It is assumed that the student is reading new content unless there is clear evidence of time pressure indicating that the activity is a drill. Activities included as a drill are:

-the aide presents Dolch word flashcards to the target student and the student reads each card aloud without hesitation (DWOD)

-the teacher sets a timer and the target student reads a list of sentences aloud (DSOD)

-the teacher says to small reading group, "Now we will practice reading the words from the story," and s/he presents flashcards quickly one at a time to the target student (DWOD)

This category is not coded if the target student is:

-reading sentences silently (DSS)

-supplying synonyms orally for words presented on flashcards (IWO)

-reciting the months of the year from memory (A)

If the target student is engaged in a reading activity in which s/he is manipulating materials, writing, listening or discussing without reading silently or orally, it is considered an indirect reading activity. Indirect reading activities are parallel to direct reading activities in the four levels of printed material, but the possible student behaviors differ. The following categories are defined with examples and non-examples provided.

Indirect Reading: Letters (IL). This category is coded if the target student is engaged in letter to sound or sound to letter correspondence in the presence of a manipulative or when the student is not required to say the sound or letter name. Examples of this category are:

-underlining the letter or blend in a word that produces a given sound

-adding S's to a list of words

-the teacher says a sound and the student orally repeats the sound without print present

-writing a letter(s) that represents the beginning sound of a series of pictures

This category is not coded if the target student is:

-copying a design (A)

-coloring a picture after completion of a page in a workbook (A)

-saying the name of a letter after hearing its sound (DL)

Indirect Reading: Oral (IWO, ISO, IPO). The distinction between this category and the "reading--oral" category is that the student is not directly reading aloud from print. S/he may be modifying a printed or oral presentation, or producing a new word, sentence or paragraph orally. This category is coded if the target student orally responds in an indirect reading activity, for example:

-the teacher says a word and the student spells it aloud (IWO)

-the student gives a synonym or an antonym aloud (IWO)

-the aide says a word and the student says a word that rhymes with it (IWO)

-the student uses a target word in a sentence and says the sentence aloud (ISO)

-the teacher says a sentence and the student orally puts it into the past tense (ISO)

-the student answers a question about a story that has just been read (ISO or IPO)

This category is not coded if the target student is:

-talking about personal events not related to a reading activity (A)

-reading a paragraph aloud from a printed page (DPO)

-reciting the days of the week from memory (A)

Indirect Reading: Written transformation or creation (IWWT, IWWC, ISWT, ISWC, IPWT, IPWC). This category is coded if the target student is engaged in an indirect reading activity and his/her response is to write or manipulate something. Writing is further coded as transformation or creation. Transformation refers to

activities that involve the students in minor changes of the material presented such as: copying, rearranging word cards, or manipulating a given written presentation in a repetitive or simple fashion (adding s or ed to verbs). A creation, on the other hand, means that the student generates the content of what is written.

An indirect reading written transformation is coded if the target student is:

-copying a paragraph from a book, ditto, blackboard, etc. (IPWT)

-adding beginnings or endings to a list of words when the whole word is rewritten (IWWT)

-writing rhyming words for a given word when the rhyme involves simple letter substitution (IWWT)

-drawing lines between words and pictures the words represent (IWWT)

-rearranging word cards to make a sentence (ISWT)

-writing a new sentence that changes a given sentence to the past tense (ISWT)

A written transformation is not coded if the target student is:

-writing a sentence to use a given word (ISWC)

-filling in single letters on a work sheet (IL)

-copying designs (A)

An indirect reading written creation response is coded if the target student is:

-writing a word to label a picture (IWWC)

-spelling a word(s) in writing (IWWC)

-writing a sentence(s) about a topic discussed (ISWC)

-writing a book report (IPWC)

-writing answers to questions about a story read (ISWC)

This category is not coded if the target student is:

-writing a word to fill in a blank when a list of word choices is presented (IWWT)

-copying a sentence from the chalkboard (ISWT)

-writing an answer to a question by finding the sentence in a story that tells what the answer is (ISWT)

Indirect Reading: Listen (IWL, ISL, IPL). This category is coded if the target student is listening to another person who is reading aloud or discussing what has just been read or s/he is listening to an audio tape/record that is reading-related. The key here is that the student is aware of the print that generated the reading or discussion. This category is coded if the target student is:

-listening to a word and its definition presented on a language master machine (IWL)

-listening to another student read a sentence aloud (ISL)

-listening to a question or an answer about a passage just read (IPL or ISL)

-listening to a taped story (IPL)

This category is not used if the target student is:

-reading along silently as s/he listens to a story (DPS)

-obviously off-task indicated by distractability
such as looking around the room or playing with a toy (X)

-listening to two students talk about which books
they will take out of the library (A or X)

Off-task (X). This category is coded if the target student is supposed to be engaged in a reading or reading-related activity but is not. A student with a reading workbook on his/her desk who is talking to another student about unrelated information would be coded as off-task of a reading activity. An X is coded if the target student:

-has his/her reading book open to a story
but is not focusing attention on the printed page

-is sitting in a small reading group and talking
to another student about unrelated material

-is standing next to an aide who is checking his/her
reading workbook and playing with a pencil

This category is not coded if the target student is:

-taking a book from a shelf (M)

-fighting with another student (Ø)

-walking towards the door of the classroom to go
to another class (M)

The remaining student observation codes presented on the bottom of Figure 1 represent categories that are used in conjunction with the activity codes previously defined. These supplementary categories reflect other aspects of the target student's behavior at the time of

observation including with whom the student is interacting and the affective nature of the interaction. Obviously, one could include here other measures of interest, for example, whether the activity is a test of information taught or the number of other students with whom the target student is interacting. Limits were set for the number of possible codes based on the following: the categories of major interest for the research effort underway, assumptions about what might affect student performance, assumptions about what behaviors can be measured reliably, the stability of the measures over time, and the limitations of how many different codes an observer can be expected to manage without confusion.

Supplementary Codes

Teacher Interaction (○). A circle drawn around letter codes indicates that the teacher was physically with the target student and interacting with that student when that student's behavior was being observed. A circle is coded if the target student is:

-part of a teacher-led instructional group ((IPL))

-having his/her work checked by the teacher who is standing beside the student's desk ((IWL))

-at a teacher table responding to questions asked by the teacher ((ISO))

A circle is not coded if the target student is:

-part of a teacher-led instructional group and the teacher is interacting with another group member about his/her specific errors ([W])

-waiting for the teacher who is interacting with another student (W)

-sitting at a desk and the teacher says something to him/her from across the room (X)

Aide Interaction (△). A triangle drawn around letter codes indicates that the classroom aide was physically with the target student and interacting with that student when that student's behavior was being observed. A triangle is coded if the target student is:

-part of an aide-led instructional group ( )

-having his/her work checked by the aide and is standing next to the aide, following along silently as s/he checks each word written ( )

-sitting at a desk with the aide and receiving instruction regarding a story s/he has just read ( )

A triangle is not coded if the target student is:

-standing next to the aide while the aide corrects the work of another student (W)

-saying something to the aide and the aide does not respond (A)

Student Teacher Interaction (▽). An upside-down triangle drawn around letter codes indicates that the student teacher was physically with the target student and interacting with that student when his/her behavior was being coded. The same examples used for teacher or aide interactions also apply here.

Student Interaction (□). A square drawn around letter codes indicates that another student(s) was physically with the target

student whose behavior was being observed. A square is coded if the target student:

-asks another student how to spell a word ([IWO])

-is playing with trucks on the floor with another student (even if they are not speaking to each other) ([A])

-is a member of a reading group ([DPS])

A square is not coded if the target student:

-is part of a teacher-led whole class lecture ((IPL))

-is playing a reading game alone while sitting next to a student who is playing with trucks (DWS)

If the target student is interacting with more than one other person, all symbols that apply are used. For example, if the target student is part of a teacher-led instructional group, the activity in which that student is engaged (e.g., IPL) would be circled and squared (i.e., ([IPL]) since s/he is interacting with other students as well as the teacher. If the teacher is giving instruction to the whole class (not a small group), and students are not expected to interact with each other in this setting, the activity codes would be only circled (e.g., (M)).

Positive (+). This code is used when the teacher, aide, or another adult praises specific student work that is well done or general student performance. Sometimes teachers use words like "good", "okay", and "allright" as a way to leave an interaction with a student (i.e., an exiting behavior) or as a verbal habit, in such a case the interaction is not coded as a positive statement. This code is used in conjunction with other codes for the target student. A

positive is coded when:

-the teacher says to the target student, "You blended those words beautifully, Johnny." ((ISL+))

-the aide says to the target student, "Susan, you're working well today." ( )

A positive is not coded when:

-the teacher, after looking at a letter matching exercise the target student is working on, says to the target student, "Okay," and walks away ((IL))

Negative (-). This code is used when the teacher, aide, or another adult makes a negative comment to the target student regarding that student's behavior. A comment is coded as negative if the quality of what is said is punitive. A negative is coded if the comment is sarcastic or degrading in its tone or intent, for example, "You did very well on that workbook page," if said sarcastically may mean that the teacher is telling the student that s/he is doing poorly. It is often used when a child is told to stop engaging in a behavior. This code is used in conjunction with other codes. A negative is coded when:

-the teacher says to the target student, "Can't you ever do anything right the first time?" ((A-))

-the teacher says to the target student, "Mary, I thought I told you to sit down." ((A-))

-the aide says to the target student, "If you don't get busy, you'll have to stay in at lunchtime." ( )

A negative is not coded when:

-the teacher says to the target student, "No, John, if a word ends with a 'y' you usually change the 'y' to 'i' before adding 'es'." ((IWL))

-the aide says to the target student, "Your handwriting is sloppy, Judy. Please rewrite this so I can read it." ((ISL))

-the teacher says to the target student, "Put away the crayons now so that you can get your work finished." ((N))

Teacher Codes

The purpose of the teacher codes is to record the quantity and nature of the teacher's interactions with individual students. There are five categories of teacher codes that delineate the type of interaction the teacher has with a student: cognitive, cognitive explanation, management, and academic other. In addition, codes are included for positive and negative interactions as well as no contact made with a student during the time sampled. Both the teacher and the aide are observed using the same codes but at different times. The codes reflect time samples rather than events. Figure 2 displays these codes.

Cognitive (C). This code is used when the teacher or aide is interacting with a student(s) in reading. The reading activity may be direct or indirect as previously defined in the student observation codes. If the teacher is interacting with more than one student, as in a reading group, every student with whom the teacher interacts will receive the same code. This category includes teacher behaviors such

as cueing and monitoring and is coded if the teacher:

-reads a paragraph aloud to a group

-asks a student to read a word or paragraph

-comments on the quality of a student's reading work

-asks a student a question about a sentence just read

-listens to a student reading orally, or waits for a student to finish reading silently

This category is not coded if the teacher:

-presents a lesson on silent e (CE)

-tells a student to get his reading book out (M)

-asks a student a question about a math problem (A)

Cognitive Explanation (CE). This category is coded if the teacher or aide tells a student(s) how to do a reading task or supplies a reading strategy. This type of behavior is what is usually meant by "teaching" or "instruction", and includes lesson presentation, modeling, and explanatory feedback. A CE is coded if the teacher:

-tells a student how to attack an unfamiliar word

-presents a blending strategy to a small reading group

-corrects a student's reading work while telling the student why an item is incorrect

This category is not coded if the teacher:

-asks a student what strategy to use to find the answer to a comprehension question (C)

-tells a small group to find the similarity in a set of words (C)

-tells the class how to get materials (M)

Management (M). This category is coded when the nature of a teacher or aide interaction is procedural or disciplinary. The interaction may involve any subject area and is not restricted to reading. An M is coded if the teacher:

-tells a student to stop fooling around

-tells the class to line up to go to another classroom

-tells a group of students to get materials or equipment

-tells a group or an individual to turn to a page in a textbook

This category is not coded if the teacher:

-asks a student how to solve a math problem (A)

-tells the class about an upcoming field trip (A)

-asks an instructional group a question about what they have just read (C)

Academic Other (A). This code is used when the teacher or aide is interacting with a student(s) in a subject area other than reading or about personal matters. An A is coded if the teacher:

-tells a student how to solve a math problem

-tells the whole class to copy a set of designs

-asks a student how s/he is feeling today

-conducts a discussion about a field trip

This code is not used if the teacher:

-tells a student to get his/her math book out (M)

-asks a small reading group if anyone has a dog like the one in the story they have just read (C)

-is not interacting with any student at the time of observation (S)

Squiggle (ξ). This code is used when the teacher or aide does not interact with any student during the time s/he is being observed. A squiggle does not merely imply that there is no verbal interaction with a student, but rather that the teacher or aide is not engaged in any type of contact with a student. The teacher may be taking care of procedural matters, preparing for a lesson, checking work that has been completed, or simply engaged in a non-student/instructional activity. For example, the teacher may be out of the room, talking to another adult, or correcting papers at a desk.

Observation Procedures

The observer begins a scheduled observation by completing all identification information on the observation form (Figure 3). This includes listing all of the students' names down the left-hand side. This system has been used to observe up to 13 students and three adults; more students are possible, but the timing would have to be altered. The system is based on a time sample, and the duration of time observed per cell varies depending upon whether the observer is watching a student or an adult. Time sampling involves observing for a specified time period within a longer time frame. The category that is coded to describe the observed time is then seen to describe the longer time period from which it was sampled. The use of a common metric (i.e., time) also allows for the direct comparison of the measures obtained.

The observer begins at a fixed (i.e., scheduled) time, watches the first student for 10 seconds, codes the behavior of that student

Observer: _____

School: _____

Teacher: _____

Date: _____

Start time: _____

End time: _____

page ___ of ___

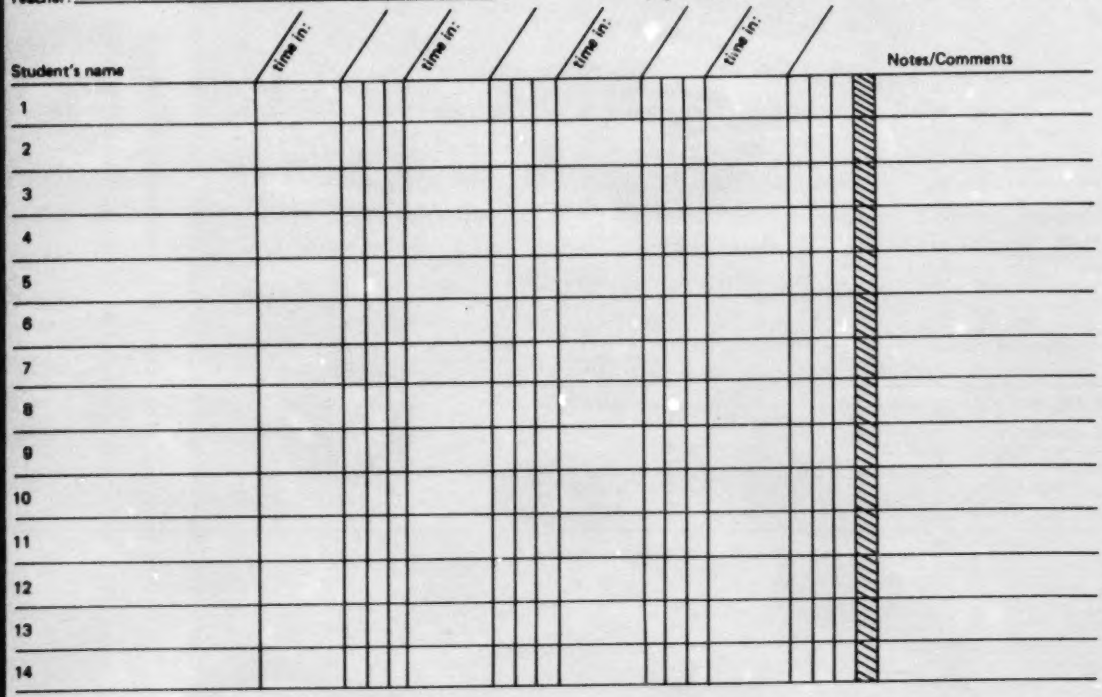


Figure 3. Observation Form

in the next five seconds, then has five seconds to move to the next student who is listed on the form. This procedure is repeated for all students being observed so that the observer is traveling through the classroom to complete each cycle of student observations. The number of students being observed determines the length of the observational cycle; for 12 students, a cycle will take four minutes to complete.

After the last student's behavior is coded, the observer moves to the teacher, watches him/her for five seconds, and uses the next 10 seconds to code the teacher's behavior. The code is placed in the cell next to each student for whom it is relevant. This is repeated once more for the teacher and then once for the aide, if an aide is present. The adult coding takes 45 seconds to complete giving the observer 15 seconds to get back to the first student and begin another complete cycle. While the time adjustments we described have been proven appropriate, other arrangements are possible by shortening or lengthening student, teacher, or aide observations.

If some students are not present, or less than 12 students are being observed, the teacher and aide should be observed immediately following the last child. The next cycle of students, however, should not be observed until five minutes (or some other pre-defined time slice) have elapsed. This permits each observation block of student behavior to represent a constant time unit.

Using the observation form for 12 students, four complete cycles represent 20 minutes of observation time. During the coding procedures, observers note on the form any ambiguous or unusual events. Immediately after the scheduled observation, observers write

up any notes or questions. These notes, along with the observation forms, are turned in to the data collection coordinator the same day and all questions are resolved at that time. Decisions are documented to assure consistency and for future reference.

The system requires the observer to code almost continuously during the scheduled classroom observation. This continuity has several advantages. First, it makes it possible to cumulate time spent on a given type of activity. Each student is observed for 10 seconds, every five minutes, for one hour. One assumes that the 10 seconds observed is a sample of the activities of the target student for the full five minutes. For every target student there are 12 samples of behavior for each hour of observation. If six of the codes are management (M), one can say that the target student spent 50 percent of his/her time (or 30 minutes) in management activities. The continuous nature of the observation system also aids in achieving high inter-rater reliability since observers do not have to determine when to start or stop coding, whether an event should be coded, or when an event begins or ends.

The definitions of categories to be coded may be quite clear and still not account for every possible situation with which an observer might be confronted. Every classroom presents new or unique activities which may be ambiguous with respect to where they fit in the observation system, and judgements or decisions often must be made on the spot. The actual process of observing in classrooms must be taught to assure that the appropriate procedures are followed, that interpretation of codes is consistent, and that the rationale of

categories is understood thereby facilitating on-line decision-making.

Observers are trained using the decision trees (Figures 1 and 2) and definitions as a foundation, accompanied by procedures for acquiring familiarity with classrooms, the coding form, and equipment needed. Each code is incorporated into the observer's repertoire by building methodically upon what has been learned and sequencing the presentation of new information based on the decision levels represented in Figures 1 and 2.

Training

The purpose of systematically training observers is to assure that all observers are using the same system, rules, and definitions of codes so that data collected at different times, in different classrooms, by different observers can be assumed to have consistent meaning for any given code. The first step in accomplishing this goal was to define the codes with real classroom settings in mind and to use examples from actual occurrences observed. This approach may not be as "clean" as using rigid definitions, but it more closely matches what an observer can expect to see in a classroom. All observers receive the set of definitions prior to the first training session so that they can get a sense of the focus of the observation system. They are instructed to review the definitions and bring them to all training sessions.

There are five training sessions. Each session includes an in-house group presentation and discussion lasting approximately one and one-half hours followed by an hour of individual classroom

practice of the observation codes learned in the presentation. The group sessions begin with a review of any information previously presented and a discussion of questions or problems arising out of the use of the system in the classroom. Practice observation forms are turned in to the trainer and checked for procedural accuracy. New codes are presented in small chunks based on the level of decision required and using Figure 1 as a graphic representation of those levels. Ambiguities existing in the understanding of new codes are discussed on a limited basis. The trainer must be aware of the difference between the type of question that is constructive and that which leads to endless and often unresolved discussion. Naive observers often ask questions beginning with "What if..." that focus on a limitless array of unique possibilities. The trainer should firmly put off these questions until the end of training by which time most of the questions will have been either answered or recognized as unlikely events, or, if appropriate, the trainer can turn the question around and ask the trainee to attempt to answer it.

After each group session, observers go into the field to practice what they have learned. Practice in actual classrooms provides a realistic setting containing all the elements that observers will need tc confront upon completion of training. They must make on-line decisions and keep up the tempo commensurate with the observation procedures. When possible, observers are paired for practice sessions so that they can compare resulting codes and discuss discrepancies. Each practice lasts for one hour and is divided into three 20-minute segments that match the group presentation format. In the first

segment, observers practice all codes previously learned. During the second and third segment, new codes are incorporated in the same order as presented during group meetings.

At the conclusion of the five training and practice sessions, each observer is paired with the trainer to observe for an hour in one of the classrooms being used for practice observations. The purpose of this session is to determine if each observer is, in fact, using the same system, rules, and definitions of codes as the trainer (i.e., expert). The criterion measure is the average inter-rater percent of agreement on each code. If an observer and trainer reach an average of 80 percent agreement, training is concluded for that observer and an assumption is made that s/he is a reliable observer at that point in time. While this procedure concludes training, checks on inter-rater reliability are on-going over the course of observations to assure consistency.

Session 1

The first group training session includes: procedures for entering classrooms and maintaining good relationships with school personnel; the materials to be used for observation; marking students who are absent or out of the room; the time unit of observation; the distinction between reading activities and other activities that might go on in classrooms; and interaction categories that will be coded.

Classroom procedures. The first objective of observer training is to develop an understanding of how to enter schools and classrooms.

This understanding ensures that school policy is followed, disruption is minimized, and cooperation is maximized. General guidelines for school behavior are presented to assure that all observers know appropriate procedures and become sensitive to the issue of being an outsider in an environment where the personnel have concerns that are not necessarily the same as those of the research team (see the Appendix). Observers are made aware of their non-participant role and learn how to enter the environment unobtrusively without being rude. They must avoid communicating with students either verbally or through non-verbal eye contact, knowing glances, or smiles. They are given suggestions on how to respond to questions about the research effort asked by school personnel or students. These suggestions stress responding briefly with a general statement such as, "We are interested in learning what goes on in classrooms." Not only is this essential for optimal cooperation, but also for precise coding since the total attention of the observer is essential to accurately observe student behavior.

At this time, observers also receive specific information about the schools and classrooms in which observations will take place. This information facilitates getting to the schools, getting around in the schools, and knowing what resources are or are not available in each. A packet is distributed to each observer containing: maps to each school, names of school personnel with whom the observer will be in contact (e.g., principal, secretary, teacher), room numbers and their location within the school building, information on the availability and location of parking facilities or other areas within

the school that may be used by outsiders, class rosters, schedules of observation times, and phone numbers of schools, other observers, and whom to contact in case a problem arises (usually the trainer/coordinator).

The next topic considered at the first training session is how observers can familiarize themselves with the students and activities of the classroom. Various strategies are discussed including arriving at the classroom early enough to become familiar with the layout of the room, the activities in which students are engaged, the materials in use, and the match between the names and the faces of the target students. Sometimes the teacher's assistance will be needed when first identifying students. Scheduling information will help in determining what the target students are supposed to be doing or when a target student will be out of the room.

Observation materials. At the first training session, observers also receive the materials necessary for observation and instructions on their use. Specifically, observers are taught to complete all identification information required on the observation form (Figure 3) including listing students as they are identified by the observer (preferably by geographic location in the classroom), with a descriptor to facilitate getting to know who each student is (e.g., curly blond). During each cycle of coding, students are observed in the same sequence. A clipboard and stopwatch with a 60-second sweep and a 60-minute accumulator are also distributed to each observer.

Out of the room or absent. Next, observers are taught the first step in actually completing an observation, that is, to match the

students identified and listed on the coding form with the class roster. There will be some students not identified by the observer because they were not in the classroom at the beginning of the practice observation. These students should be listed last on the coding form. The observer must determine whether a student is temporarily out of the room or absent for the day. This can be done by consulting the class schedule, or by directly asking the teacher or aide. If the student is absent, all cells for that student are marked with a curving line (~~). If a student is not absent but is also not in the classroom, each observation cell is marked with an X at the time s/he is to be observed.

Time unit. The observation system is based on a sampled unit of time, therefore, it is crucial that observers become familiar with the length of time they will have to watch a student or adult, code, and move to the next target subject. Since the content of the activity with which a student is engaged is to be coded, observers must move close to the target student in order to be able to see and hear what that student is doing. Observers begin to get the pace of this movement during the first session. The more familiar an observer is with the time unit, the less frequently s/he will have to refer to the stopwatch. The trainer explains the time sampling procedure; observers are trained to use the time unit during their first practice session by starting their stopwatches, marking a cell with two Xs after 10 seconds, waiting until another 10 seconds have elapsed, then repeating the process until all 12 cells of a cycle are complete.

At the end of the student cycle, observers are instructed to move

to the teacher column, wait for five seconds, code one X for any student(s) the trainer indicates as interacting with the teacher, let 10 seconds elapse, then repeat the same procedure once more for the second teacher column and once again for the aide column. If the teacher or aide is said not to have interacted with any student during the observed time, a squiggly line (no interaction) is drawn down the column reserved for that time period. A complete cycle of 12 students, a teacher, and an aide should take four minutes and 45 seconds to complete, allowing 15 seconds to begin the next student cycle (i.e., every five minutes).

Interaction codes. This segment of the group training session is meant to focus the observer's attention on the target student's interactions, if any. Observers are instructed to continue to mark two Xs as time indicators during the second segment of the in-class practice, but also to mark if the student is interacting with the teacher ( ), aide ( ), student teacher ( ), or another student ( ). This set of codes is incorporated into the system next because their definitions are relatively straightforward and unambiguous, leaving little chance for confusion and thereby assuring success. Emphasis is placed on the definition that for an interaction to be coded, the person with whom the target student is interacting must be in physical proximity to that student.

Discriminating between direct reading and all other activities. The first meaningful letter code taught is the direct reading code (D). Observers are to replace the first X they have been marking for a target student with a D if the target student is engaged in a direct

reading activity at any level. If the target student is doing anything else, observers will continue to mark "XX." It is stressed that a direct reading code requires that the target student be looking at print and reading either silently or orally.

Classroom practice. Before beginning each practice session, observers complete all identification information required on the observation form. Upon entering the classroom, they list each student to be observed with a descriptor and determine if any student is absent. The practice session is divided into three 20-minute segments.

During the first segment of their first in-class practice, observers code for four cycles using only Xs as the codes marked. At the end of this 20-minute segment, observers should have a sense of how long 10 seconds is, how long five seconds is, how to move from student to student, familiarity with the students' names, the room arrangement, and the observational materials. Observers practice using interaction codes for the second 20-minute segment. Interaction codes are superimposed on the Xs already being marked. For example, a target student who was interacting with another student at the time of observation would be coded as [XX] during the second practice segment. Observers practice using the "D" code for the third 20-minute segment of their in-class observation. A student observed reading aloud to the teacher would, therefore, be coded as (DX).

Observers also keep a running list of any questions or problems that arise during the practice observation. It is preferable to have an experienced observer or trainer accompany a trainee into the field

during practice sessions if possible. The experienced observer will be better able to recall ambiguous situations and note problems of which the novice may not even be aware. In any case, if the observer keeps good notes on what his/her concerns are, they form the basis of discussion at the beginning of the next training session.

By the end of the first hour-long practice session, observers should be familiar with entering the school and classroom, the observation materials, marking students who are not present in the classroom, the time unit, the interaction codes, and determining which activities are considered direct reading activities.

Session 2

At the beginning of the second training session, observers review all information taught to date, discuss their various field experiences, and resolve any questions or problems that have arisen since the first session. Each observer turns in his/her practice observation form to the trainer to be checked for procedural accuracy.

Discriminating indirect reading activities from all other activities. The general category of indirect reading activities is presented next. These activities are distinguished from direct reading by not exhibiting all of the components of directly reading print.

Any manipulation or transformation of printed material or a listening task is considered to be indirect reading. Indirect reading activities are distinguished from non-reading activities by the presence of printed material with which the target student is engaged and are coded as IX.

At this time, observers also learn their first rule for dealing with more than one possible code. If a target student is engaged in both a direct and indirect reading activity during the 10 seconds of observation, it is coded as a direct reading activity. For example, if a student reads a word aloud to the teacher, then adds several new endings to the word orally, this behavior is coded as (DX). This decision rule is the first of a series of rules based on the principle that priority be given to behaviors that most closely approximate direct reading.

Observers are also instructed to begin to discriminate between reading codes and all other codes for the teacher and aide observations. If the teacher or aide interacts with any student in reading or reading-related activities, observers replace the single X with a C for those students with whom the adult interacts in reading.

Discriminating the level of direct and indirect reading activities. In the final segment of session 2, observers are taught to focus on the level at which a direct or indirect reading activity occurs. An activity coded as either D or I is also coded for Letters, Words, Sentences, or Paragraphs (a second level decision using Figure 1 as a "decision tree") by replacing the "X" in "DX" or "IX" with an L, W, S, or P. Emphasis is placed on what a target student is actually doing not solely on the material with which s/he is confronted. In other words, a student looking at a page of sentences with a blank in each one may be transforming words to fit the sentence and may not be involved with the sentence at all.

Classroom practice. The first 20-minute segment of this practice session is intended as a review and includes only those codes used at the end of session 1.

During the second segment of this practice session, observers mark: DX, IX, XX, X (out of the room), or ~ depending on what the target student is doing; ○, △, ▽, or □ if an interaction occurs; and X, C, or { for the teacher/aide observations.

The final 20 minutes of practice incorporates all codes mentioned above plus the code for the level of the activity (i.e., L, W, S, P). Once again, observers are asked to note any questions or problems that arise during their practice observation. By the end of the second training session, observers should be able to discriminate: direct and indirect reading activities from non-reading activities, the difference between direct and indirect reading activities, and the level of a direct or indirect reading activity.

Session 3

Once again, this session begins by reviewing all previously taught codes and clarifying definitions and decision rules with which observers had any difficulty during in-class practice sessions. Observers are instructed to add an X to any direct or indirect reading code marked, yielding three-letter codes for that cell (e.g., DPX).

Student response mode. The way in which a student responds in a direct or indirect reading activity is a third level decision. Observers are taught to replace the "X" at the end of the D or I codes with a letter representing whether the target student is responding

silently (S), orally (O), by writing (W), or by listening (L). The decision tree (Figure 1) is used as a guide to determine in which type of activity (i.e., direct reading or indirect reading) these codes could appear. A direct reading activity can be coded as silent (S) or oral (O). If the reading activity is indirect, it can be coded as oral (O), written (W), or listen (L).

Observers are reminded of the definitions of all categories considered so far and again instructed to become thoroughly familiar with the definitions before beginning their next in-class practice session.

Discriminating between non-reading activities. Up to this point in training, regarding student observations, observers have been marking non-reading activities as "XX". They are now instructed to replace the two Xs with the appropriate codes for the remainder of the first level decision possibilities: waiting (W); academic other (A); management (M); off-task, reading (R); or off-task, other (∅). Definitions of these categories are thoroughly reviewed and the distinctions between them made clear through a variety of examples.

Rules for coding when more than one activity occurs during a 10-second observation are discussed again emphasizing that observers select the "higher" level code or the one that is the closest approximation to the terminal goal. Therefore, if the two activities are direct reading and indirect reading, the direct reading activity is coded; if an indirect reading activity and another academic activity or a management activity occur, the indirect reading activity is coded; if an academic activity and a management activity occur

during the same 10 seconds, the academic activity is coded. The order of selection for first level codes is: direct reading, indirect reading, academic other, management, waiting, out of the room. If the choice is at the level of a direct or indirect reading activity, the order is: paragraph, sentence, word, letter. The order of priority for student response mode codes is: silent, oral, written, listen. The only case where this logic does not hold is for the off-task codes. If the target student is off-task more than briefly (i.e., two seconds or more), s/he is coded as off-task. The time distinction was made to account for the possibility that the presence of the observer or another person might act as a distraction from which the student recovers almost immediately.

For the teacher/aide observation, observers are presented with the distinctions between cognitive (reading) interactions (C), management interactions (M), and other academic interactions (A). The same principles underlying the distinctions made for student observations also apply for the teacher and aide observations.

Classroom practice. The first 20 minutes of practice for this session are intended as a review of codes taught in session 1 and session 2 with one exception. This time observers add another "X" to the end of any direct or indirect reading activity coded at the word, sentence, or paragraph level (e.g., DPX) as a "place holder" for the next coded level to be incorporated into the system. At the letter level, there are no additional reading codes, therefore, observers are not taught to build on either a DL or IL code.

In the second segment of the practice session, observers incorporate the third level codes for student response mode. They now use three letter codes for direct or indirect reading activity: D or I; L, W, S, or P; and S, O, W, or L.

The last four cycles of practice incorporate all first-level codes (including non-reading codes), the level of printed material with which the student is engaged, the mode of student response, and all teacher/aide contacts.

Session 4

The presentation for the fourth training session begins by reviewing and clarifying all codes and procedures used by the end of the third practice session.

Drill, transformation, creation and cognitive explanation. Some reading activities have a fourth code in addition to the codes previously delineated. The first additional code presented is drill (D). Drill means that when the target student is directly reading aloud, the material with which s/he is engaged is already known and the activity is meant to increase the fluidity or automaticity of his/her reading. It is emphasized that observers look for specific evidence that an activity is a drill such as a timer or flashcards that are presented at a set pace. Drill can only occur, according to its definition, in a direct reading oral activity (i.e., DWOD, DSOD, DPOD).

The second type of activity with a fourth level code is an indirect reading written activity. If the student response mode is to

write, observers must decide if the student is transforming (T) material that is presented or generating new material (creation;C). In order to code the activity as creation, observers must look for an indication that what the student is writing does not appear in some form in a book, on a ditto, on the chalkboard, etc.

The final teacher/aide code is also added at this point. Cognitive explanation (CE) is a sub-category of the cognitive code. Emphasis is placed on the special requirements for a cognitive interaction to be considered a cognitive explanation; that is, the teacher or aide tells a student how to do a reading task. The information presented by the adult must be specific and instructional.

Affective codes. Codes for praise (+) and negative (-) statements are added last. Emphasis is placed on the fact that, by definition, in order to code a praise or negative statement, the adult must be in physical proximity to and interacting with the student being observed. Affective codes can be used for academic or behavioral interactions and are used for both student and adult observations.

Classroom practice. The first 20-minute segment of in-class practice for this session corresponds to the last segment of practice for the third session and includes coding: whether an activity is direct reading, indirect reading, or non-reading (D, I, A, M, W, Ø, Ø, X, ~); the level of a direct reading or indirect reading activity (L, W, S, P); the mode of the student's response (S, O, W, L); any interaction that occurs(○, △, ▽, □); and the content of any teacher/aide interaction (ξ , C, M, A).

During the second segment, observers practice using the fourth level student observation codes and the cognitive explanation adult observation code in conjunction with all other codes used to date.

Observers use the last 20 minutes of their in-class observation to incorporate the affective codes for student and adult observations. At this point, all codes have been defined, discussed, and used in practice sessions.

Session 5

This is the final training session. All definitions, procedures, and rules are reviewed. Questions and problems are discussed. For the classroom practice session, observers use the total observational coding system. The trainer should accompany each observer and code at the same time as the observer. This procedure is a check on the adequacy of training and the inter-rater reliability achieved between the observer and trainer prior to the final reliability check, which occurs about one week after training is complete. If the percentage of agreement between the trainer and an observer is not adequate at this practice session, the codes that have not met criterion (80% agreement) form the basis for individual remediation before training can be considered complete.

Data Processing

Procedures for converting observation information into a form that is computer readable involves assuring that the information is correct before and after it is entered into the computer, deciding the format for the entry, and converting symbolic codes into numeric

codes. The conversion from observation codes to data codes must retain the precision of all information originally collected so that any given observation can be reconstructed. It is only after the original entry of observation data that decisions are made to delete or collapse codes for purposes of analysis.

The first step in data processing actually occurs throughout the data collection period. Immediately after each observation, observers turn in observation forms to whomever is in charge of retrieving this data. If any questions or problems are noted on the form, they are resolved quickly to assure that all necessary information is fresh in the observer's mind. Any on-line decisions made are documented and disseminated to other observers in the field. The observation forms are then checked for completeness, procedural accuracy, clarity, and impossible codes. This is the first in a series of check points to verify the data collected.

Since inter-rater reliability checks are built into the schedule of observations to assure that all observers maintain agreement over the course of the data collection effort, there are some observation periods for which there are two sets of forms. The average percent agreement is calculated for these observations by hand so that any discrepancies can be identified quickly and feedback provided to those observers involved. More sophisticated observer agreement checks are made later.

The next task is to assign numeric codes to the identification information recorded on the observation form. Identification codes are assigned to schools, classrooms, students, observers, dates and

times of observation, and to record whether the observation was also a reliability check. The coding of this information protects the anonymity of those involved in the study and permits sorting the data based on characteristics of interest (e.g., only observations that occur in the morning). While the codes are assigned arbitrarily, a master list of all codes used and their referents is maintained in case errors are discovered or it becomes necessary to reconstruct the original data at some future point in time.

Numeric codes are also assigned to the letters and symbols used for observation. Assignment to columns is based on the heirarchy of observation coding. Figure 4 presents the numeric assignment of each letter and symbol and its order of placement. In the first column, each first level student observation code is assigned a unique numeral ranging from 0 to 8 since there are nine possible general observation codes: absent (0), waiting (1), direct reading (2), indirect reading (3), academic other (4), out of the room (5), management (6), off-task other (7), and off-task reading (8). If either a D (2) or an I (3) (the two reading categories) have been coded in column 1, the next two or three columns will contain a number other than zero. Column 2 presents the numeric codes for the level of the printed presentation: letters (1), words (2), sentences (3), or paragraphs (4). Column 2 is assigned a zero if the activity was <u>not</u> a direct or indirect reading activity. Column 3 is used for the mode of student response: written (1), oral (2), silent (3), listen (4). Once again, a zero is assigned to this column if the activity was <u>not</u> a direct or indirect reading activity as noted in Column 1. If the mode of student response is

Column 1	Column 2	Column 3	Column 4	Column 5 &6	Column 7	Column 8	Column 9
~ = 0	No code = 0	No code = 0	No code = 0	No code = 00	No code = 0	No code = 0	No code = 0
W = 1	L = 1	W = 1	T = 1	= 01	+ = 1	C = 1	+ = 1
D = 2	W = 2	O = 2	D = 2	= 02	- = 2	CE = 2	- = 2
I = 3	S = 3	S = 3	C = 3	= 03		M = 3	
A = 4	P = 4	L = 4		= 04		A = 4	
X = 5				= 05		⌇ = 5	
M = 6				= 06			
⌀ = 7				= 07			
✗ = 8				= 08			
				= 09			
				= 10			

50

Figure 4; Numeric codes for observation data

coded as either O (oral) or W (written), then it is possible to have a non-zero number assigned to column 4. Column 4 is used to note if an oral reading activity is a drill (2) and if a written activity is a transformation (1) or a creation (3). Column 4 is assigned a zero if the reading code does not contain a fourth level distinction. Direct and indirect reading codes use a maximum of four columns to account for the four letter codes possible, therefore, a cell containing the letters IWWT would be coded as 3211 where each number is unique and derives its meaning from its placement. If an observation code does not indicate a reading activity, zeros are assigned to columns 2, 3, and 4 (e.g., A = 4000).

Two columns (5 and 6) are needed for interaction codes since there are 11 possible combinations of interactions ranging from no interaction to interacting with one other person (e.g., the teacher) to interacting with two others during the same cell of observation (e.g., the teacher, aide, student teacher, and/or another student). Although it would be possible to include five more types of interaction for combinations of three or four others with whom a student can interact, we have found these interactions to occur so infrequently as to not be worth recording. The seventh column is reserved for affective interactions and three codes are possible: no affective code (0), praise (1), and negative (2).

Columns 8 and 9 are used for teacher observation codes. There are six possible codes for the first of these two columns corresponding to the nature of the teacher interaction: cognitive (1), cognitive explanation (2), management (3), academic other (4),

and no interaction (5). A zero is assigned if the teacher or aide did not interact with the target student during the sampled time period. The second column used for teacher observations, column 9, contains the numeric code for the affect of the interaction: no affective code (0), praise (1), and negative (2).

Each observation cell is coded in order beginning with the first student observation (7 columns), then the two teacher and one aide observation cells (6 columns), using a 13-column field. This procedure is repeated for the entire hour of observation totalling 48 cells to be coded for each student for each observation session. One hundred fifty-six (156) columns are necessary using the scheme presented above.

Once numeric codes have been assigned and entered onto computer coding sheets, coders are paired to verify the completeness and accuracy of the data coded by matching the observation forms, the master lists of assigned codes, and the computer sheets. The data is then entered into the computer system for each observation period and datalists are printed for each dataset. The datalists are verified by another pair of coders using the coding sheets and computer printouts. Finally, a computer check for impossible codes is made as the last verification procedure. Any discrepancies identified are corrected by going back to the original observation coding forms, talking to the observer involved, or making decisions based on classroom scheduling or identification information. At this point, the data is assumed to be as accurate as possible and ready for decisions to be made as to how the codes are to be used for analysis.

Generalizability

An important concern in using any measuring device is its reliability. Currently, the most comprehensive approach to reliability is generalizability (Cronbach, Gleser, Nanda, & Rajaratnam, 1972). Essentially, generalizability estimates are derived from an examination of possible systematic sources of variation in the data other than the source of interest. In the case of an observation system such as SOBR, one might be concerned that the observer was an unintentional source of variation. One observer might tend to count management behavior as off task more frequently than another, leading to a consistently higher count of off task behavior and lower count for the management category for that observer. Or, one might feel there is a systematic variation due to when one observed. Ideally, one would consider all of the facets together, code by observer by occasion. However, the size and the complexity of the available data set preclude such a simultaneous consideration. For the purpose of this paper, the sources of variation reported include observer and occasion.

The findings of one analysis of observer data suggest that virtually no variation is associated with observer after training. This data comes from a set of studies on learning disabilities (Cooley, Leinhardt, & Zigmond, 1979). That is, on the occasions when two observers observed the same events in the same classrooms, their coding was so close as to be virtually identical. Every observer (n = 9) observed at least once with every other observer and twice with the person in charge of quality control. (For details of the observer facet, see Lomax, 1980.)

Each observer was responsible for two or three classrooms, and each classroom had a maximum of four observers (never more than two at one time). In addition to using intra-class correlation estimates, on-line percentage agreements were calculated for each reliability check, and total correlations by observer across codes and across children were calculated. The results were similar to the "g" study (Lomax, 1980). Percentage agreement after training for each occasion averaged in the high 80s; the average correlation over all reliabilities was .92. Essentially, it is safe to say that inter-observer agreement is not a problem when the procedures described earlier are followed.

For a restricted set of all higher level codes and for the teacher codes, the percent of variation associated with occasion (based on 30 hours of observation) ranged from .05 to .01. Thus, the reliability of the observations over occasion ranges from .95 to .99. This means that one could observe for less than 30 hours per student without serious loss of reliability. An important point to remember in considering this information is that it was gathered on children for whom it is usually thought to be especially difficult to obtain reliable behavioral data (i.e., children with learning disabilities). From both of these estimates of generalizability, one can say that it is likely that observed variation between children is real and represents differences in their behavior rather than when they were observed or by whom. For a more detailed explanation of the reliability of SOBR, the reader is referred to Lomax, 1980.

Data Use and Validity

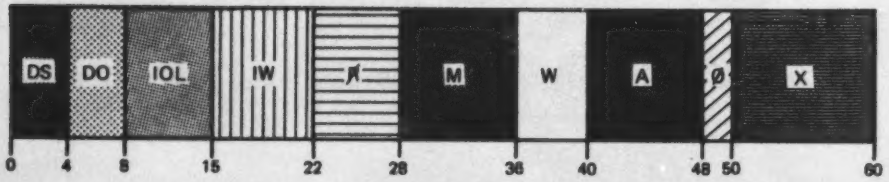
Data derived from the SOBR can be used in a variety of ways, for example: to construct measures of an area of particular interest, to describe time usage, and/or to predict academic growth in reading. To date, SOBR has been the observational instrument used in the following research studies: Benson, 1979; Cooley, Leinhardt, & Zigmond, 1979; Cooley & Mao, 1980; DiCostanzo, 1980; Ebert, 1980; Ebert & Vallecorsa, 1980; Leinhardt, Zigmond, & Cooley, 1980; Lomax, 1980; and Vallecorsa, 1979.

Constructing measures. Figures 1 and 2 are the basis for combining data into measures. While it is possible to look at each unique combination alone, Figures 1 and 2 represent over 11,000 unique possibilities, only a few (two hundred or so) of which occur with sufficient frequency to warrant further discussion. In examining reading behaviors, there are two basic approaches to the combination of information: level of presentation (word, sentence, paragraph), and mode of response (silent, oral, listen, etc.). Thus, one could use the data to form four measures of time usage in reading from letters through paragraphs by collapsing along rows across columns, or one could collapse down columns across level to form measures such as oral or silent reading. One could also retain both level and mode and have 20 measures which ignore drill, transformation, creation, adult presence, or instructional grouping. Decisions as to which level of refinement to use can best be made by examining frequencies of occurrence and considering the important issues of concern for the study undertaken.

In addition to deciding how to combine measures, another issue of concern is how to weight the measures. The simplest form of weighting is to add up all the occurrences of the category of interest for a given child and multiply by the time block (5 minutes) to obtain a measure of the amount of time a child was observed in the particular activity of interest, for example, reading silently. Such a summation, however, does not adjust for unequal amounts of observation time (for example, Robert was observed for 32 hours, Sarah for 28, and Richard for 27). In order to adjust for unequal amounts of observation, the total for a code can be divided by some logical unit of the observations (number of twenty-minute segments, number of hours, number of mornings, etc.). Standardizing in this way, however, does not adjust for known scheduling differences or absences. For example, William and Mary were both observed for 30 hours in two different classrooms, but William's teacher, Naomi, schedules three hours of reading a day, while Mary's teacher schedules reading for two hours a day. This difference can be accounted for by multiplying by a coefficient that incorporates the scheduling information. For details of exactly how a fairly complex weighting system can be constructed, see Cooley & Mao (1980).

Time usage. Data derived from SOBR can be used to describe how typical blocks of time are devoted to different activities, or to compare different settings or children. Figure 5 shows the distribution of time across children for a typical 60-minute reading period in an LD room. The units are number of minutes.

Figure 6 shows the distribution of time for a typical day.



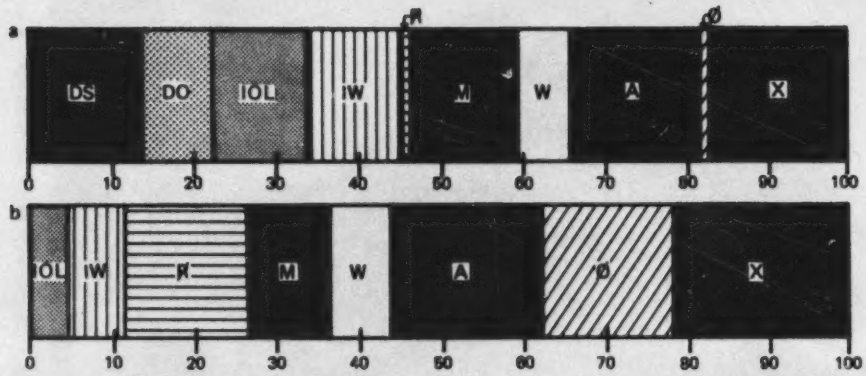
Label	Measure	Mean in Minutes	S.D.
DS	Silent Reading	4.1	2.8
DO	Oral Reading	4.1	2.0
IOL	Discussion	6.3	2.1
IW	Writing	7.2	3.1
⊬	Off-Task Reading	6.1	3.9
M	Management	7.8	2.1
W	Waiting	4.5	1.8
A	Academic Other	7.8	3.6
Ø	Off-Task Other	2.4	1.7
X	Out of Room	9.7	5.6

Figure 5. Distribution of Time During an Average 60-Minute Reading Session in a Learning Disabilities Classroom (n=105)

(Scale: Minutes per Hour)

Label	Activity	Mean in Minutes	S.D.
DS	Silent Reading	13.7	8.8
DO	Oral Reading	13.4	7.5
IOL	Discussion	22.8	8.0
IW	Writing	25.2	11.4
/\	Off-Task Reading	22.5	15.5
M	Management	34.2	9.7
W	Waiting	21.2	7.8
A	Academic Other	55.5	17.6
Ø	Off-Task Other	19.0	10.7
X	Out of Room	59.9	27.7

Figure 6. Distribution of Time During an Average Day in a Learning Disabilities Classroom (n=105)
(Scale: Minutes per Day)



Label	Measure	Percentage: [a]Child With Highest Total Direct Reading	Percentage: [b]Child With Lowest Total Direct Reading
DS	Direct Silent	14	0
DO	Direct Oral	9	0
IOL	Indirect Discussion	11	4
IW	Indirect Written	11	8
Ø	Off-Task Reading	1	15
M	Management	13	10
W	Waiting	7	7
A	Academic Other	16	19
Ø	Off-Task Other	1	16
X	Out of the Room	16	22

Figure 7. Comparison of Time Usage Between Two Children
(Scale: Percentage per Day)

Figure 7 contrasts two children, one with the highest percentage of direct reading, the other with the lowest direct reading per day. The point of these three time figures is to give a sense of the kind of comparison and metric that can be developed with data from SOBR.

Predicting achievement. Another use of SOBR is to relate information about time spent in various activities to growth in competence in those areas. Table 1 presents the simple correlation matrix of data obtained in the course of the study reported by Leinhardt, Cooley, & Zigmond (1980). The purpose here is merely to show, for inspection, how various activities relate to each other and to reading performance. This analysis may serve in part to validate the measures obtained, however, validity of observational instrumentation relies more heavily on the rationality and care with which observations are made than on simple zero order correlations. More significant evidence of the validity of the system is provided in the various reports mentioned earlier.

Conclusion

SOBR is a time-sample system of observation designed to capture a student's beginning reading activities. While the focus of the instrument is on reading, non-reading activities are also used to permit continuous and inclusive coding. Observers are required to make few judgments because overt student behaviors are the focus of observation and all events can be coded. The analytic tree provides a visual reminder of the content of the codes, permits observers to follow a specific order in making logical decisions, provides a conceptual background to increase the observer's understanding of the

Table 1

Correlations of Selected Variables from SOBR and a Reading Test (n = 105)

	1	2	3	4	5	6	7	8	9	10	11	12
1. Pre Spache Composite	1.00	0.91	0.63	0.06	-0.12	0.06	-0.16	-0.16	-0.06	-0.20	-0.36	-0.00
2. Post Spache Composite	0.91	1.00	0.67	0.16	-0.06	0.10	-0.18	-0.09	-0.04	-0.24	-0.37	0.09
3. Direct Silent	0.63	0.67	1.00	0.23	0.09	0.04	-0.27	-0.03	-0.05	-0.09	-0.48	0.15
4. Direct Oral	0.06	0.16	0.23	1.00	0.18	0.08	0.12	0.31	-0.14	-0.03	-0.23	0.26
5. Indirect Oral/Listen	-0.12	-0.06	0.09	0.18	1.00	-0.32	-0.37	0.08	0.03	0.22	0.04	0.48
6. Indirect Written	0.06	0.10	0.04	0.08	-0.32	1.00	0.37	0.26	0.03	-0.42	-0.37	0.28
7. Off-Task Read	-0.16	-0.18	-0.27	0.12	-0.37	0.37	1.00	0.38	-0.07	-0.34	0.14	-0.06
8. Management	-0.16	-0.09	-0.03	0.31	0.08	0.26	0.38	1.00	-0.22	0.04	0.10	-0.00
9. Waiting	-0.06	-0.04	-0.05	-0.14	0.03	0.03	-0.07	-0.22	1.00	-0.13	-0.11	0.28
10. Academic Other	-0.20	-0.24	-0.09	-0.03	0.22	-0.42	-0.34	0.04	-0.13	1.00	0.34	-0.26
11. Off-Task Other	-0.36	-0.37	-0.48	-0.23	0.04	-0.37	0.14	0.10	-0.11	0.34	1.00	-0.35
12. Teacher Cognitives	-0.00	0.09	0.15	0.26	0.48	0.28	-0.06	-0.00	0.28	-0.26	-0.35	1.00

system, and allows for the easy and logical combination of codes to form measures.

Using time as a common metric for all observations permits not only a coherent interpretation of the measures derived, but also enables one to generalize to appropriate periods of time from which the observations were sampled (e.g., a reading period, an hour, a day, etc.).

SOBR was developed over a three-year period through pilot testing, brainstorming, revision, and observations in a variety of settings. It has been used successfully in the studies previously cited and appears to be reliable over observers and occasion. The system also yields measures shown to predict end-of-year achievement in reading in classrooms for learning-disabled students.

The notion of not only how much time a student spends on task in a given instructional domain but time on what task, has proven to be a significant addition to our understanding of the variables that affect student learning. One can use the information gleaned from this instrument to determine what specific reading activities relate to an increase in performance as well as to describe the use of student time. This kind of specific instructional information can then be further utilized to provide feedback to teachers regarding how they allocate time in their classrooms and how students use the time available.

Appendix

GENERAL SCHOOL BEHAVIOR

When entering a school, it is important that any personnel look and act in a professional manner. Following a few simple guidelines will aid in acceptance and facilitate cooperation. This does not imply relinquishing individuality while in the schools, but it does mean that courteous and considerate behavior is expected. These guidelines are suggested:

1) If for any reason you will not be able to follow your schedule, call the trainer as soon as possible.

2) Dress appropriately. Jeans and T-shirts are not acceptable in most schools. Imagine that you are the principal of the school and dress accordingly.

3) Be considerate of school parking facilities. Be careful not to park in someone's assigned space, or to block other cars or entrances. If the school lot is small, or if there is any question as to whether or not you can park there, park on the street.

4) When arriving, report to the office in the school building. Each school has different procedures, but most require that external personnel sign in and out or inform the secretary that they are in the building and the purpose of their visit.

5) Set up and organize all materials at least 20 minutes before you are scheduled to begin.

6) If the teacher's room is used for waiting, leave it in the same way it was found. If there is a coffee maker, leave money (usually 25 cents a cup) for any coffee that you drink.

7) If any difficulty arises which you cannot handle, call the research office immediately.

8) Be as efficient as possible. Try to cause as little disruption to the school or classroom processes as possible.

9) Maintain a professional approach at all times. Be friendly but not "chummy." Respect the teacher's position as the authority in his/her classroom. Respect the principal's authority as head of the school. And most of all, respect the enormous load that all school personnel must handle. Try to be flexible and calm no matter what happens.

10) Maintain distance with the children. Being nice does not mean being patronizing or motherly.

11) Be open and accepting of any suggestions made by school personnel. If the suggestions do not conflict with the interest in obtaining precise data, try to be as accommodating as possible.

12) If teachers or other school personnel ask questions about what you are doing, be polite, answer briefly, and try not to discuss the matter in any great detail.

13) Never talk about a child, teacher, class, or any other school personnel while in the school. Remember that as an outsider, personal views will not be appreciated.

14) Never discuss another school while on site. This can only lead to discomfort of those at the present site, as they will be concerned about what might be said about them at the next site.

15) Remember that the school is a self-contained world with its own values, problems, joys, and conflicts. What is said and done in one world with little fear of misrepresentation cannot always be said or done with similar consequences in the school's world.

16) Be appreciative. Thank all involved for their time and assistance.

17) Remember to sign out or to let someone know you are leaving when you depart from the school building.

18) Always drive slowly and carefully near any school building.

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